

REMARKS:

- 1) Referring to item 10) of the Office Action Summary, the Examiner is respectfully requested to approve and accept the formal drawings originally filed with this application on November 20, 2003.
- 2) A few minor typographical errors have been corrected in the specification. These amendments do not introduce any new matter. Entry of the amendments is respectfully requested.
- 3) The claims have been amended as follows.

Independent claim 1 has been amended to make clear that the melted resin is generated by melting a solid resin material in a cavity provided in the lower mold, and that the electronic component is immersed in the melted resin still in this cavity, and further that the resin molded product includes the electronic component in a set resin formed by setting the melted resin also still in the same cavity provided in the lower mold. These features are supported in the original disclosure at page 3, lines 13 to 14; page 12, lines 22 to 33; claim 2; etc., so that this amendment does not introduce any new matter.

Claim 2 has been amended for conformance and streamlining in view of the amendment of independent claim 1.

Independent claim 9 has been amended to make clear that the solid resin material consists of a solid resin material that is adapted, sized and shaped to be placed in a mold cavity provided

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in a mold pair, and further minor clarifications. These amendments are supported in the original disclosure, for example at page 3, lines 13 to 14; page 12, lines 12 to 33; claim 2; Fig. 1A; etc., so that this amendment does not introduce any new matter.

Claim 10 has been amended for conformance and streamlining in view of the amendment of claim 9.

New claims 12 and 13 have been added. Claim 12 is supported by the original disclosure of page 7, lines 25 to 33 and Fig. 1A. Claim 13 is supported by the original disclosure of page 7, lines 4 to 14 and page 8, lines 27 to 33. Thus, the new claims do not introduce any new matter.

Entry and consideration of the claim amendments and the new claims are respectfully requested.

- 4) Referring to sections 4 and 5 on page 3 of the Office Action, the allowance of claims 5 to 8 is appreciated. Claims 5 to 8 have been maintained without amendment, and should thus still stand allowed.
- 5) Referring to section 3 on pages 2 to 3 of the Office Action, the rejection of "claims 1 - 11" (sic: claims 1 - 4 and 9 - 11) as anticipated by US Patent 6,081,978 (Utsumi et al.) is respectfully traversed. This rejection will be discussed with regard to each of the rejected independent claims 1 and 9.

- 6) Present independent claim 1 has been amended to clarify certain features of the invention.

Most importantly, according to present claim 1, the melted resin is generated in a cavity provided in the lower mold by melting a solid resin material in this cavity of the lower mold. In other words, a solid resin material is present in the mold cavity, and then this solid resin material is melted in order to produce a melted resin in situ or in place in this mold cavity.

Further according to present claim 1, the electronic component is then immersed in the melted resin still in this same mold cavity in which the resin was melted. Namely, the melted resin is produced by melting a solid resin material in the mold cavity, and then the melted resin remains in this same cavity and the electronic component is immersed in the melted resin in this cavity.

Still further according to present claim 1, the method involves forming a resin molded product, which includes the electronic component in a set resin, by setting the melted resin to produce the set resin still in the same mold cavity in which the resin was initially melted, as mentioned above.

Thus, throughout the steps of generating the melted resin by melting a solid resin material, immersing the electronic component in the melted resin, and forming the resin molded product, the resin (i.e. first the solid resin material, then the melted resin, and finally the set resin) is situated and remains in the same mold cavity. The prior art does not disclose (and would not have suggested) such a combination of method steps.

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- 7) Utsumi et al. disclose a method of resin-encapsulating a semiconductor device by molding and solidifying a melted resin material around the semiconductor device.

In the disclosed method, the resin material is injected in a molten state from an external resin melting pot (not shown) through a gate (31e) and a runner (31d) into each of the mold cavities (31c) (see col. 4, line 46; col. 5, lines 4 and 17; col. 7, line 18; col. 8, lines 42 to 46; especially col. 9, lines 6 to 10; col. 10, line 3; and col. 12, lines 28 to 34).

Contrary to the present invention, Utsumi et al. do not disclose (and would not have suggested) generating a melted resin within the mold cavity (31c) by melting a solid resin material directly in this mold cavity (31c). Instead, Utsumi et al. expressly require a melted resin to be generated outside and remotely from the mold cavity (31c) in a resin melting pot (not shown), and then require the melted resin to be injected through the gate (31e) and the runner (31d) into the mold cavity (31c) (col. 9, lines 6 to 10). Accordingly, this pertinent step of present claim 1 is not disclosed and would not have been suggested by the significantly different molten resin injection step of Utsumi et al.

While the melted resin is generated in a different "cavity" according to Utsumi et al., namely in the separate resin melting pot (not shown), such a resin melting pot cannot be considered as the mold cavity recited in present claim 1, because the method of Utsumi et al. does not involve immersing an electronic component into the melted resin in the resin melting pot, and also does not involve forming a resin molded product by setting

the melted resin in the resin melting pot. Those two further steps of "immersing the electronic component" and "setting the resin", if at all, might be asserted to be associated with the mold cavity (31c). Thus, the resin melting pot (not shown) cannot correspond to the presently recited mold cavity in which such further steps take place.

For the above reasons, the invention of present independent claim 1 and its dependent claims is not anticipated by and would not have been obvious from the disclosures of Utsumi et al.

- 8) Present independent claim 9 is directed to a solid resin material.

This material consists of a solid resin material that is adapted, sized and shaped to be placed in a mold cavity provided in a mold pair. Furthermore, this solid resin material is adapted to be used as a raw material for being melted to produce thereof a melted resin in a resin-encapsulation method.

More particularly, the claimed solid resin material has such a size and shape that correspond to a size and a shape of the mold cavity in which the solid resin material is adapted to be placed and melted. Namely, for example, as shown in present Fig. 1A, the solid resin material is sized and shaped to fit into and correspond to the size and the shape of the mold cavity, into which the solid resin material (in its solid state) is to be placed.

The prior art does not disclose (and would not have suggested) such a solid resin material.

- 9) According to Utsumi et al., a molten resin material is injected into the mold cavity (31c), as discussed above.

Utsumi et al. do not disclose a resin consisting of a solid resin material that is adapted, sized and shaped to be placed into the mold cavity (31c). To the contrary, Utsumi et al. do not expressly disclose any solid resin as a raw starting material at all. Instead, Utsumi et al. merely state that "a pot (not shown) ... houses a molten resin material" (col. 9, lines 7 to 8, underlining added), and then this molten resin material is injected into the mold cavity (31c) (col. 9, lines 8 to 10; col. 10, lines 2 to 3; etc.).

There is no express disclosure of any solid raw material that was used to produce the molten resin material. It is acknowledged that such a molten resin material can conventionally be produced from a solid resin material in the resin melting pot. Such a solid resin raw material may conventionally be, e.g., in a granular or pellet form to be supplied into the melting pot. In any event, there is no prior art disclosure or suggestion to provide a resin consisting of a solid resin material that is adapted, sized and shaped to be placed directly into the mold cavity in which the electronic component is to be resin-encapsulated. Most importantly, Utsumi et al. include no disclosure and no suggestions in this regard.

After the molten resin is injected into the mold cavity (31c), the resin solidifies and forms a resin encapsulation. The resulting re-solidified resin encapsulation cannot be regarded as the present solid resin material, because it does not consist of a solid resin material, but rather necessarily includes the

electronic component, bonding wires, and the like encapsulated within the re-solidified resin material.

In view of the above, the invention of present independent claim 9 and its dependent claims is not anticipated by, and would not have been obvious from, the disclosures of Utsumi et al.

- 10) For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claim 1 to 4 and 9 to 11 as anticipated by Utsumi et al.
- 11) New claims 12 and 13 recite additional features that further distinguish the invention over the prior art. Contrary to present claim 12, Utsumi et al. do not disclose and would not have suggested a solid resin material being a solid plate consisting of the solid resin material and having a stepped sectional shape with stepped side walls. Contrary to present claim 13, Utsumi et al. do not disclose and would not have suggested a step of placing the solid resin material into the mold cavity by transporting and depositing the solid resin material into the cavity using a vacuum-holding conveyor.
- 12) Referring to section 6 on page 4 of the Office Action, the additional prior art made of record requires no particular comments because it has not been applied against the claims.

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- 13) Favorable reconsideration and allowance of the application, including all present claims 1 to 13, are respectfully requested.

Respectfully submitted,

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